

12/17/15 "The things which hurt, instruct" -Benjamin Franklin

HW: Discriminant w/s #1-10
Test 2 on Tuesday 12/22

AIM: What is the Discriminant?

Warm Up:

1) Use the quadratic formula to determine the roots of the following equation?

$$x^2 + 2x + 1 = 0$$

$a=1$ $b=2$ $c=1$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(1)}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{0}}{2}$$

$$x = \frac{-2 \pm 0}{2} = \frac{-2}{2} = \boxed{-1}$$

$$\textcircled{1} \ 6p^2 - 2p - 3 = 0$$

$$a = 6$$

$$b = -2$$

$$c = -3$$

$$b^2 - 4ac$$

$$(-2)^2 - 4(6)(-3)$$

$$4 + 72$$

$$= \boxed{76}$$

Describe the roots of the following:

zeros x-intercepts
Solutions

2. $x = \frac{1 \pm \sqrt{-3}}{3}$ \leftarrow Imaginary

3. $x = \frac{1 \pm \sqrt{7}}{3}$ Real, Irrational, Unequal

4. $x = \frac{1 \pm \sqrt{4}}{3}$ Real, Rational, Unequal

$x = \frac{1+2}{3}$ or $\frac{1-2}{3}$
 $\frac{3}{3} = 1$ or $\frac{-1}{3}$

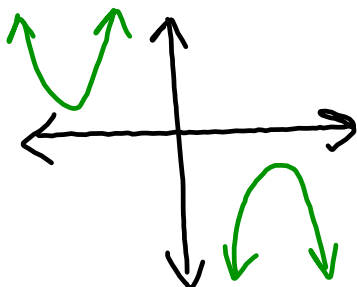
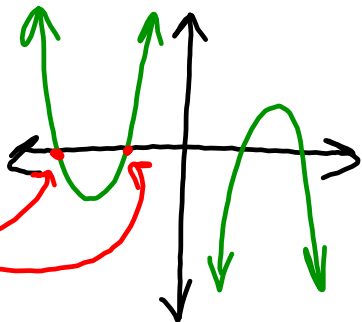
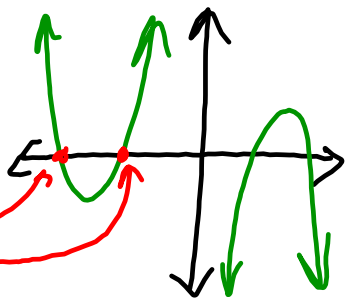
5. $x = \frac{1 \pm \sqrt{0}}{3}$ Real, Rational, Equal.

$\frac{1+0}{3} = \frac{1}{3}$ $\frac{1-0}{3} = \frac{1}{3}$

Is there a way to determine the nature of the roots without actually solving for the roots?

Discriminant

$$b^2 - 4ac$$

Discriminant	Nature of the Roots	Graph
$b^2 - 4ac < 0$ (Negative)	Imaginary	
$b^2 - 4ac > 0$ (Perfect Square) (Positive)	Real, Unequal, Rational	
$b^2 - 4ac > 0$ (NOT Perfect) (Positive)	Real, Unequal, Irrational	
$b^2 - 4ac = 0$	Real, EQUAL, Rational.	